

Claims

[c1] What is claimed is:

1. A mobile phone comprising:
a baseband circuit for generating a communication signal;
a matching circuit electrically connected to the baseband circuit for adjusting a phase or a magnitude between a current and a voltage of the communication signal to generate a corresponding transmitting signal;
an antenna for wirelessly broadcasting the transmitting signal to generate a corresponding receiving signal;
a receiving circuit for transmitting the receiving signal to the baseband circuit; and
a duplexer electrically connected between the matching circuit and the antenna for transmitting the transmitting signal to the antenna and for transmitting the receiving signal to the receiving circuit;
wherein the matching circuit is capable of changing the phase or the magnitude between the current and the voltage of the communication signal without changing the phase or the magnitude between the current and the voltage of the receiving signal, such that the field pattern of the antenna for signal-transmitting in a wireless man-

ner is not affected as that of the antenna for signal-receiving in a wireless manner.

- [c2] 2. The mobile phone of claim 1 further comprising:
a microphone electrically connected to the baseband circuit for receiving sound waves to generate an audio signal, the baseband circuit being used for processing the audio signal to generate the communication signal; and
a speaker electrically connected to the baseband circuit; wherein the baseband circuit is further used for processing the receiving signal to generate a corresponding sound signal, the speaker being used for transforming the sound signal into sound waves.
- [c3] 3. The mobile phone of claim 1 wherein the matching circuit has at least an electrical element, the phase or the magnitude between the current and the voltage of the communication signal being changed as the element parameter of the electrical element is changed.
- [c4] 4. The mobile phone of claim 3 wherein the electrical element is a capacitor, and the element parameter is a capacitance of the capacitor.
- [c5] 5. The mobile phone of claim 3 wherein the electrical element is an inductor, and the element parameter is an inductance of the inductor.

[c6] 6. The mobile phone of claim 1 further comprising:
a power controller electrically connected between the baseband circuit and the matching circuit for adjusting the power of the communication signal, and for then transmitting the adjusted communication signal to the matching circuit; and
an isolator electrically connected between the matching circuit and the power controller for transmitting the communication signal from the power controller to the matching circuit, and for reducing the reflected signal from the matching circuit to the power controller to protect the power controller.

[c7] 7. The mobile phone of claim 1 further comprising a second matching circuit electrically connected between the duplexer and the receiving circuit for changing the phase or the magnitude between the current and the voltage of the receiving signal to adjust the field pattern of the antenna for signal-receiving.

[c8] 8. A method for adjusting properties of a mobile phone, the mobile phone comprising:
a baseband circuit for generating a communication signal;
a matching circuit electrically connected to the baseband circuit for adjusting a phase or a magnitude between a

current and a voltage of the communication signal to generate a corresponding transmitting signal, wherein the matching circuit has at least an electrical element, the phase or the magnitude between the current and the voltage of the communication signal being changed as the element parameter of the electrical element is changed;

an antenna for wirelessly broadcasting the transmitting signal to generate a corresponding receiving signal; a receiving circuit for transmitting the receiving signal to the baseband circuit; and

a duplexer electrically connected between the matching circuit and the antenna for transmitting the transmitting signal to the antenna and for transmitting the receiving signal to the receiving circuit;

the method comprising: changing the element parameter of the electrical element of the matching circuit so as to change the phase or the magnitude between the current and the voltage of the communication signal without changing the phase or the magnitude between the current and the voltage of the receiving signal, such that the field pattern of the antenna for signal-transmitting in a wireless manner remains as that of the antenna for signal-receiving in a wireless manner.

[c9] 9. The method of claim 8 wherein the electrical element

is a capacitor, and the element parameter is a capacitance of the capacitor.

- [c10] 10. The method of claim 8 wherein the electrical element is an inductor, and the element parameter is an inductance of the inductor.
- [c11] 11. The method of claim 8 wherein the mobile phone further comprises:
 - a power controller electrically connected between the baseband circuit and the matching circuit for adjusting the power of the communication signal, and for then transmitting the adjusted communication signal to the matching circuit; and
 - an isolator electrically connected between the matching circuit and the power controller for transmitting the communication signal from the power controller to the matching circuit, and for reducing the reflected signal from the matching circuit to the power controller to protect the power controller.
- [c12] 12. The method of claim 8 wherein the mobile phone further comprises a second matching circuit electrically connected between the duplexer and the receiving circuit for changing the phase or the magnitude between the current and the voltage of the receiving signal to adjust the field pattern of the antenna for signal-receiving.

[c13] 13. The method of claim 8 wherein the mobile phone further comprises:

a microphone electrically connected to the baseband circuit for receiving sound waves to generate an audio signal, the baseband circuit being used for processing the audio signal to generate the communication signal; and a speaker electrically connected to the baseband circuit; wherein the baseband circuit is further used for processing the receiving signal to generate a corresponding sound signal, and the speaker is used for transforming the sound signal into sound waves.

[c14] 14. A mobile phone comprising:

a baseband circuit for generating a first communication signal and a second communication signal;

a first power controller electrically connected to the baseband circuit for adjusting power of the first communication signal;

a first matching circuit electrically connected to the first power controller for receiving the first communication signal from the first power controller, and for adjusting a phase or a magnitude between a current and a voltage of the first communication signal to generate a corresponding first transmitting signal;

a second power controller electrically connected to the baseband circuit for adjusting power of the second com-

munication signal to generate a corresponding second transmitting signal;

an antenna for wirelessly broadcasting the first transmitting signal and the second transmitting signal;

a diplexer having an output port electrically connected to the antenna, and two input ports respectively electrically connected to the first matching circuit and the second power controller, the diplexer being used to transmit the first transmitting signal and the second transmitting signal to the antenna;

wherein the first matching circuit is capable of changing the phase or the magnitude between the current and the voltage of the first communication signal without changing the phase or the magnitude between the current and the voltage of the second transmitting signal, such that the field pattern of the antenna for transmitting the first transmitting signal in a wireless manner is not affected as that of the antenna for transmitting the second transmitting signal in a wireless manner.

[c15] 15. The mobile phone of claim 14 further comprising a second matching circuit electrically connected between the diplexer and the second power controller for changing the phase or the magnitude between the current and the voltage of the second transmitting signal without changing the phase or the magnitude between the cur-

rent and the voltage of the first transmitting signal, such that the field pattern of the antenna for transmitting the second transmitting signal in a wireless manner is not affected as that of the antenna for transmitting the first transmitting signal in a wireless manner.

- [c16] 16. The mobile phone of claim 14 further comprising a second isolator, electrically connected between the second matching circuit and the second power controller, for transmitting the second transmitting signal from the second power controller to the second matching circuit, and for reducing the signal reflected from the second matching circuit to the second power controller, so as to protect the second power controller.
- [c17] 17. The mobile phone of claim 14 further comprising a first isolator, electrically connected between the first matching circuit and the first power controller, for transmitting the first transmitting signal from the first power controller to the first matching circuit, and for reducing the signal reflected from the first matching circuit to the first power controller, so as to protect the first power controller.
- [c18] 18. The mobile phone of claim 14 wherein the baseband circuit controls the first communication signal and the second communication signal operating at different fre-

quency bands.

- [c19] 19. The mobile phone of claim 14 further comprising a microphone electrically connected to the baseband circuit for receiving sound waves to generate an audio signal, the baseband circuit being used for processing the audio signal to generate the first communication signal and the second communication signal.
- [c20] 20. A method for adjusting properties of a mobile phone, the mobile phone comprising:
 - a baseband circuit for generating a first communication signal and a second communication signal;
 - a first power controller electrically connected to the baseband circuit for adjusting power of the first communication signal;
 - a first matching circuit electrically connected to the first power controller for receiving the first communication signal from the first power controller, and for adjusting a phase or a magnitude between a current and a voltage of the first communication signal to generate a corresponding first transmitting signal; wherein the first matching circuit has at least an electrical element; the phase or the magnitude between the current and the voltage of the first communication signal being changed as the element parameter of the electrical element is changed;

a second power controller electrically connected to the baseband circuit for adjusting power of the second communication signal to generate a corresponding second transmitting signal;

an antenna for wirelessly broadcasting the first transmitting signal and the second transmitting signal;

a diplexer having an output port electrically connected to the antenna, and two input ports respectively electrically connected to the first matching circuit and the second power controller, the diplexer being used to transmit the first transmitting signal and the second transmitting signal to the antenna;

the method comprising:

changing the element parameter of the electrical element of the first matching circuit, such that the first matching circuit is capable of changing the phase or the magnitude between the current and the voltage of the first communication signal without changing the phase or the magnitude between the current and the voltage of the second transmitting signal, in which the field pattern of the antenna for transmitting the first transmitting signal in a wireless manner is not affected as that of the antenna for transmitting the second transmitting signal in a wireless manner.

[c21] 21. The method of claim 20 wherein the mobile phone

further comprises a second matching circuit electrically connected between the diplexer and the second power controller for changing the phase or the magnitude between the current and the voltage of the second transmitting signal without changing the phase or the magnitude between the current and the voltage of the first transmitting signal, such that the field pattern of the antenna for transmitting the second transmitting signal in a wireless manner is not affected as that of the antenna for transmitting the first transmitting signal in a wireless manner.

- [c22] 22. The method of claim 20 wherein the mobile phone further comprises a second isolator electrically connected between the second matching circuit and the second power controller for transmitting the second transmitting signal from the second power controller to the second matching circuit, and for reducing the signal reflected from the second matching circuit to the second power controller, so as to protect the second power controller.
- [c23] 23. The method of claim 20 wherein the mobile phone further comprises a first isolator electrically connected between the first matching circuit and the first power controller for transmitting the first transmitting signal from the first power controller to the first matching cir-

cuit, and for reducing the signal reflected from the first matching circuit to the first power controller, so as to protect the first power controller.

- [c24] 24. The method of claim 20 wherein the baseband circuit controls the first communication signal and the second communication signal operating at different frequency bands.
- [c25] 25. The method of claim 20 further comprising a microphone electrically connected to the baseband circuit for receiving sound waves to generate an audio signal, the baseband circuit being used for processing the audio signal to generate the first communication signal and the second communication signal.